



Electricity Engineers'  
Association



# CAPABILITY DEVELOPMENT TRAINING COURSES 2024/25

## Contents

---

Capability Development with the EEA .....	1
Professional certificate in Power Systems Design .....	3
Micro-credential in Overhead Line Design.....	8
Overhead Line Design Mathematics.....	11
Safety in Design Course .....	15
Lead Investigator Training - Incident Cause Analysis Method (ICAM).....	17
Understanding the Safety Manual Electricity Industry (SM-EI) .....	19
How to access the Knowledge Network and EEA courses.....	21

### Useful Links

Email: [admin@eea.co.nz](mailto:admin@eea.co.nz)

[eea.co.nz/Site/memberships/](http://eea.co.nz/Site/memberships/)

Professional Development section of the EEA

Follow the Electricity Engineers' Association on LinkedIn

## Capability Development with the EEA

---

Aotearoa New Zealand's entire energy sector is undergoing a transformation as the nation seeks to decarbonise and embraces electrification. Yet, there is growing concern at the future shortfall of technical and engineering capability needed to transition to these outcomes.

Now more than ever, we need to build the size and capability of our workforce by supporting our people with ongoing learning and encouraging many more to join us.

Within this dynamic and rapidly changing environment the EEA has been working with industry to provide a common, structured programme of learning and development, that supports current and future industry needs.

These specialised, engineering and technical courses have been developed by industry, for industry. The result is that learners receive high-quality learning and expertly-targeted professional and capability development.

This booklet provides companies, their engineering, technical, and HR staff with a list of all available EEA courses and micro-credentials for their use.

Courses use 'blended learning' and have been designed to fit around full-time work. They are delivered via a mix of self-directed online learning, webinars (led by industry subject matter experts) and written (scenario-based) assessments.

This work is part of the EEA's wider strategy, to support the growth of a sustainable, capable, skilled, and high performing engineering workforce on the ground – critical to meeting our future delivery, investment, and decarbonisation challenges.

From tools such as the Knowledge Network, networking forums, online learning, professional credentials, and information on engineering and technical careers, the EEA enables members to continuously grow their skills.

I encourage all business and their staff to make continuous learning a goal for your year and use this booklet to plan for your professional development. In doing so, you are playing a key part of providing the nation with sustainable, reliable, and safe electricity for today and into the future.

Peter Berry

A handwritten signature in black ink that reads "Peter Berry".

Chief Executive

Electricity Engineers' Association of New Zealand

## Professional certificate in Power Systems Design

Designed and delivered in collaboration with ElectroNet, the Professional certificate in Power Systems Design (PSD) was created for graduate engineers, paraprofessionals, and seasoned engineers to expose them to various aspects of power systems design in the Aotearoa New Zealand context.

These courses are designed to fit around full-time work, and are delivered via a mix of self-directed learning, webinars (led by industry experts), and written and scenario-based assessments.

### Professional certificate structure

The Professional Certificate is made up of the following eight courses:

PSD-010	Power System Components for Electricity Supply
PSD-020	Substation Design for Electricity Supply
PSD-030	Earthing Systems for Electricity Supply
PSD-040	Protection Systems for Electricity Supply
PSD-050	Operating Systems for Electricity Supply
PSD-060	High Voltage Plant for Heavy Industry
PSD-070	Low Voltage Systems for Electricity Supply
PSD-080	Power System Optimisation for Electricity Supply

To be eligible for the Professional certificate participants will need to complete:

PSD-010 Power System Components (prerequisite)

Any one of PSD-020, PSD-030, PSD-040, PSD-050; and PSD-080 Power System Optimisation.

PSD-060 and PSD-070 are designed for specific parts of the distribution supply chain (high voltage installations and low voltage reticulation) and are optional only.

*Once completed, participants will receive a Certificate of Completion for the course.*

### How you will learn

Each of the courses has been designed to take approximately 20 hours, allowing you to credit your participation to your Engineering NZ CPD hours. The format includes:

- up to 8 hours online theoretical learning
- 8 hours in case-study based workshops
- a quiz and scenario-based assessment

### Who should participate

You are eligible to participate if you are:

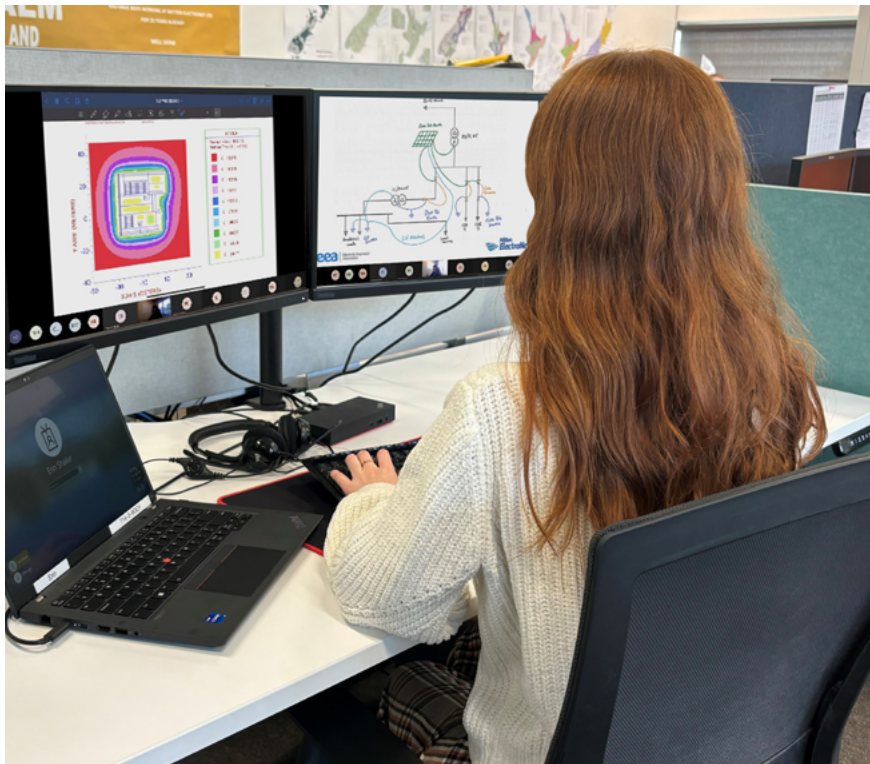
- an engineering diploma graduate, and you are employed in the NZ power industry.
- hold an engineering degree
- an experienced vocational worker (e.g., line mechanic) and you have your employer's support to enter an engineering role within your organisation.

If you aren't sure, please contact the EEA directly.

## Who is involved

The EEA is proud to be partnering with ElectroNet to design, develop and deliver all of the courses in the Professional Certificate in PSD. ElectroNet provide market-leading electrical design and consulting services across Aotearoa New Zealand, and have the breadth of industry knowledge and expertise to provide you with:

- high quality learning outcomes
- engaging and interesting case-studies
- confidence that what you are learning is industry best-practice



## Professional certificate in Power Systems Design – Individual Courses

Upon completion of these courses, you will be able to:

### PSD-010 Power System Components for Electricity Supply

Describe the functional requirements of a power system, and how technology and demand is changing the way electricity supply assets are configured.

### PSD-020 Substation Design for Electricity Supply

Describe the functional requirements for substations, explain how design decisions are made, evaluate and present options to improve the safety and performance of an existing substation.

### PSD-030 Earthing Systems for Electricity Supply

Describe the purpose and objectives of earthing, explain how design decisions are made, and resolve earthing system design problems.

### PSD-040 Protection Systems for Electricity Supply

Describe the purpose and objectives of protection systems, evaluate a range of protection devices, and design a protection scheme to meet a given set of safety and performance requirements.

### PSD-050 Operating Systems for Electricity Supply

Describe the purpose and objectives of operating systems, evaluate a range of software-based communication and control tools, and participate in the design of a control centre.

### PSD-060 High Voltage Plant for Heavy Industry

Describe the workings of high voltage equipment used in industrial settings and evaluate and optimise the safety and efficiency of an industrial power system.

**PSD-070 Low Voltage Systems for Electricity Supply**

Describe the workings of equipment used in low voltage reticulation for a variety of settings and design an interface between a low voltage system and a high voltage system.

**PSD-080 Power System Optimisation for Electricity Supply**

Describe the security, reliability and safety of a high voltage network configuration and make recommendations for improvement.

**Micro-credential in Overhead Line Design**

The EEA in partnership with the Overhead Line Design Forum and a range of line design experts have developed the eight courses that comprise the micro-credential. Based on AS/NZS 7000:2016 and HB 331:2020, and incorporating tools provided by members of the forum this micro-credential continues to grow and improve to meet the needs of distribution line designers.

The micro-credential in Overhead Line Design has been developed by experienced distribution overhead line designers to meet the skills needs of their colleagues and those wishing to become line designers.

**Micro-credential structure**

The micro-credential comprises:

- OLD-010 Line Design Principles
- OLD-020 Conductor Solutions
- OLD-030 Insulator Solutions
- OLD-040 Pole Solutions
- OLD-050 Cross-arm Solutions
- OLD-060 Stay Solutions
- OLD-070 Foundations and Footings
- OLD-080 Line Design Practice (portfolio-based assessment)

To complete the micro-credential candidates must complete OLD-010, OLD-080 and at least one of the six technical modules (OLD-020 to OLD-070).

## How you will learn

**OLD-010 Line Design Principles** is delivered in four sections over a one-month period. Each section consists of an online learning module followed by a 1hr webinar with an industry expert.

**OLD-020 to OLD-070** (the technical modules) involve the review of 'technical notes' and the resolution of a problem associated with the relevant technical component. These modules also include an assessed quiz, and we encourage participants to work together to do peer and Safety in Design (SiD) reviews.

**OLD-080 Line Design Practice** is a capstone assessment, involving the submission and assessment of a portfolio of your own work.

You will gain a working knowledge of:

Mechanical and electrical design theory

Designing for clearance, and for the environment

The components and elements that make up a line system

Component materials (historic, common, and emerging trends)

Component-based design parameters and calculation methods

Field-based challenges associated with construction and maintenance

You will also practice:

Applying relevant legislation, standards and codes of practice to line design

Producing deliverables required for communicating design intent

Two-way involvement in peer review and Safety in Design reviews

Translating designs into safe and functional solutions

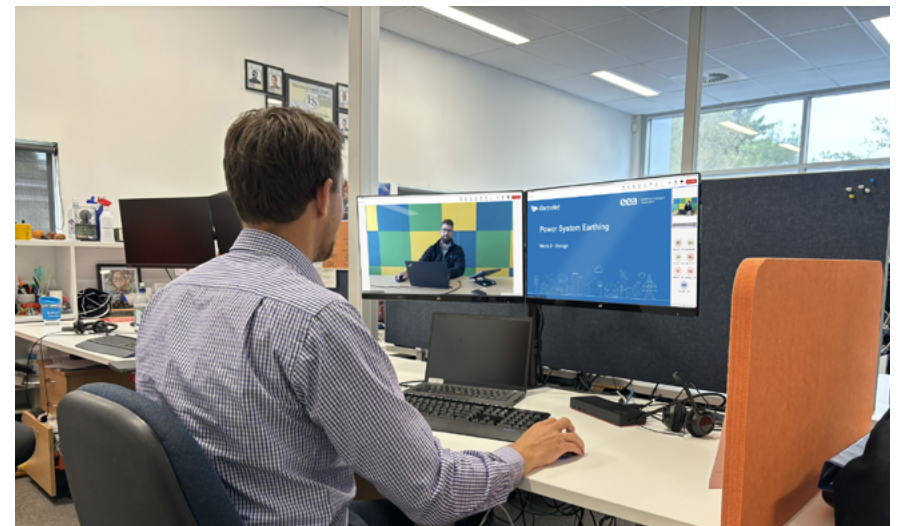
The course is designed to help line-mechanics and others become line designers through a mix of education, training, and employer and peer support. The only prerequisite is you must be working in a distribution company, or for a consultant or contractor to a distribution company and have the support of your employer/supervisor.

## Who is involved

We have embraced the concept of Kāhui Ako (Communities of Learning) in the development and delivery of the micro-credential modules. To this end, we have been fortunate to work with a range of individuals and organisations, including:

- Carl Rathbone, formally of PowerNet and now as the director of LineSmarts.
- Rob Douglas, of Energy Edge and PowerNet.

We also wish to acknowledge the members of our Line Design Forum and micro-credential alumni for helping to continue improving these modules.



## Overhead Line Design Mathematics

---

### Overview

The Introduction to Overhead Line Design Mathematics course was developed in response to feedback from those who participated in the micro-credential in Overhead Line Design who felt their mathematics knowledge needed refreshing before beginning the technical modules.

The course is not a compulsory part of the micro-credential but is recommended.

The course has been designed to support entry into the micro-credential for those who either haven't studied math for quite some time, or who feel they need to refresh their basic algebra and trigonometry knowledge before beginning one of the micro-credential modules.

The course is suitable for technical engineers and electrical tradespeople who work as a line designer and are aware of gaps in their knowledge of the mathematics involved. Participants will already have a basic understanding of electrical theory and NCEA Level 1 (or equivalent) mathematics skills.

Through the course, you will be able to perform basic mathematic calculations, to interpret and use engineering formulae, and perform checks on engineering design calculations.

Theoretical knowledge and skills are shared through two stand-alone modules delivered in webinar workshops. Practice is undertaken as homework between workshops, and 'cheat-sheets' are provided as takeaways to help you in your job.

The two modules are:

- Module 1 – Algebraic equations (delivered in three 1.5hr workshops)
- Module 2 – Trigonometry (delivered in two 1.5hr workshops)





## Micro-credential in Overhead Line Design – Individual Modules

---

Upon completion of these modules, you will be able to:

### OLD-010 Line Design Principles

Use engineering principles and methods to determine the safety and performance levels of overhead electricity distribution system components in New Zealand, under a given set of variables. This module provides foundational theory which is prerequisite to further study in overhead line design. The module consists of four sections, with assessment involving participants answering a series of knowledge-based questions (duration 50hrs).

### OLD-020 Conductor Solutions

Design a conductor solution for an overhead distribution line, using a whole of life design approach, and in accordance with sound Safety in Design (SiD) principles (duration 30hrs).

### OLD-030 Insulator Solutions

Design an insulator solution for an overhead distribution line, using a whole of life design approach, and in accordance with sound Safety in Design (SiD) principles (duration 30hrs).

### OLD-040 Pole Solutions

Design a pole solution for an overhead distribution line, using a whole of life design approach, and in accordance with sound Safety in Design (SiD) principles (duration 30hrs).

### OLD-050 Cross-arm Solutions

Design an cross-arm solution for an overhead distribution line, using a whole of life design approach, and in accordance with sound Safety in Design (SiD) principles (duration 20hrs).

### OLD-060 Stay Solutions

Design a stay solution for an overhead distribution line, using a whole of life design approach, and in accordance with sound Safety in Design (SiD) principles (duration 30hrs).

### OLD-070 Foundations and Footings Solutions

Design a foundation and footing solution for an overhead distribution line, using a whole of life design approach, and in accordance with sound Safety in Design (SiD) principles (duration 30hrs).

### OLD-080 Line Design Practice (portfolio-based assessment)

OLD-080 Line Design Practice is a capstone (final) assessment, involving the submission and assessment of a portfolio of your own work for those wishing to be awarded the EEA Micro-credential in Overhead Line Design.

Participants most likely to benefit from this course will be overhead line design professionals wishing to increase the scope of their technical knowledge, or overhead line operators studying with a view to transition into overhead line design practice.

The design submitted will be required to meet a range of criteria to be provided in advance. Participants are then expected to prepare their own individual designs in their workplace and submit them for assessment.

The module should take participants approximately 50 hours to complete, with participants required to achieve a grade of 75% to be endorsed with the Line Design Practice module.

Line Design Practice is open to anyone, but only those who have completed OLD-010 Line Design Principles and at least one of OLD-020 to OLD-070 and OLD-080 can be awarded the micro-credential.

## Safety in Design Course

Based on the EEA's Safety in Design Guide (2016) the purpose of the Safety in Design (SiD) course is to give participants an understanding of the contribution of a variety of perspectives to SiD, and practice using a selection of risk-based tools and techniques in real-world scenarios.

### How you will learn

The SiD course involves a comprehensive online component (taking approximately 6hrs), followed by either a full-day onsite workshop, or four, 2hr group webinars over a four-week period. You can choose which type of workshop is best for you and your organisation.

Once complete, we offer an organisational SiD Maturity Assessment. The purpose of the assessment is to objectively assess an organisation's SiD maturity, with the results presented in the form of a SiD improvement plan.

### Who is involved

We have embraced the concept of Kāhui Ako (communities of learning) in the delivery of the SiD courses. ElectroNet and other experts tutor the course, and we work with you beforehand to ensure that your needs are catered to, and that the case studies are relevant.

Workshops include:

- Case studies provided by other organisations who have completed the courses, and have donated their material and lessons learned
- Case studies provided by you.

### Who should participate

The course options are provided to take account of the different needs of those involved in the SiD process in the power industry. Participants to date include:

- Chief executives, senior leaders and team members
- Design and construction engineers
- Project, procurement and construction managers and officers.

We wish to acknowledge the work of Marshall Clark for the development of this course and Transpower, WEL Networks and Network Waitaki for the use of their case studies.



## Lead Investigator Training - Incident Cause Analysis Method (ICAM)

High quality Health and Safety in Employment (HSE) investigations that consistently identify factors to prevent re-occurrence are critically important to the sustainability of organisations, to maintain employee, customer and shareholder confidence.

Through the lead incident investigator course, participants will learn to use the Incident Cause Analysis Method (ICAM); a highly practical and structured method in which to conduct HSE investigations.

### How you will learn

The two-day classroom-based course is summarised in the table below. In addition, participants will receive a practical toolkit to support their investigations using ICAM. The classroom-based component covers:

- An introduction to systemic investigations
- An introduction to understanding human error in the context of organisational systems.
- Data gathering methods including witness interviewing
- Data organisation methodologies (timeline and fault tree processes)
- Data analysis using the ICAM model
- Development of corrective and preventative measures
- Practical application of incident investigation tools in case studies

### Day One

Opening address and introductions

Introduction to ICAM

Case study one

Human error and safety occurrences

Data gathering using the PEEPO tool

Data organising using timelines and "5 Why's Tools"

Case study two

Witness interview techniques and exercise

### Day Two

ICAM application

Data transition and analysis

Corrective action development

Case study two completion

Syndicated investigation exercise

Presentations by syndicates

Just Culture and disciplinary issues

### Who should participate

The ICAM course is open to all participants who want to be introduced to or improve their incident investigation skills.

### Who is involved

The ICAM course is provided by the EEA and presented by Safety Wise Solutions (SWS), who are the licence holder for the ICAM training in Australasia. The SWS company principal developed ICAM at BHP Billiton based on Professor James Reason's research into human factors and safety.

## Understanding the Safety Manual Electricity Industry (SM-EI)

---

The EEA and the Safety Standards and Procedures Group (SSPG) have developed quizzes designed to support understanding of the digital SM-EI and industry safety rules for employers and individuals.

### How you will learn

The SM-EI quizzes are provided in two forms and can be either:

- accessed via the EEA's Knowledge Network.
- provided as SCORM files for companies to upload into their own Learning Management Systems (LMS).

The SM-EI quizzes are designed to be used by practitioners, planners and managers and are ideally suited for refresher training activities.

### SM-EI assessments structure

The six SM-EI quizzes include:

SM-EI Safety Awareness (SA) for New Workers  
 SM-EI Safety Equipment (SE) for Trainees  
 SM-EI Safety Measures (SM) for Practitioners  
 SM-EI Safety Guidance (SG) for Field Leaders  
 SM-EI Safety Planning (SP) for Planners  
 SM-EI Safety Systems (SS) for Management

The specific quizzes and quiz banks are designed:

**SM-EI Safety Awareness (SA) for New Workers** – to test those who participate in prescribed health and safety activities before work and during work, and to meet legislative requirements.

This includes familiarisation with safety procedures, contributing to risk assessments, and ensuring safe working practices for tasks assigned, maintaining hazard awareness during work, and responding to incidents.

**SM-EI Safety Equipment (SE) for Trainees** – to test those who are using equipment designed for personal protection and worksite protection. This includes wearing the prescribed PPE, setting up safe positions to work from, and leaving the worksite and all work-related equipment.

**SM-EI Safety Measures (SM) for Practitioners** – to test those who are using procedures prescribed for the establishment and maintenance of a safe working zone. This includes isolation, testing, and earthing techniques and other safety measures, and the safe use of tools for work on electricity assets (whether live or de-energised).

**SM-EI Safety Guidance (SG) for Field Leaders** – to test those who guide field workers through safety procedures and safe working practices and record all actions in accordance with legislative requirements. This includes the worksite safety plan, reporting and responding to incidents, and capturing new work requirements and opportunities to improve health and safety practice.

**SM-EI Safety Planning (SP) for Planners** – to test those who produce instructions required for field work to be carried out safely, extracting relevant information from the Health and Safety Management System, and providing it in a format that can be easily followed.

**SM-EI Safety Systems (SS) for Management** – to test those who provide and maintain a Health and Safety Management System, to meet the legislative requirements of being the person with the primary duty of care for health and safety at work.

## How to access the Knowledge Network and EEA courses

### Course information

All course information including dates and prices and links for course registration are available on the **Professional Development section of the EEA website**.

Some courses or modules can be started at any time of the year, while others need a minimum number of attendees to start as a cohort together to allow for collaboration and group work. For these courses, once we reach enough registrations, we will confirm the start date with you.

You can also email us [admin@eea.co.nz](mailto:admin@eea.co.nz) to let us know you are interested in a future course.

### Pricing and payment

In general, EEA course prices are discounted for EEA members and staff of corporate members, or if bought as part of a package (e.g., for the Micro-credential in Overhead Line Design, or for an in-house SiD course).

If you wish to join the EEA you can visit the **Membership section of the EEA website** and the reduced pricing will be applied to your course registration.

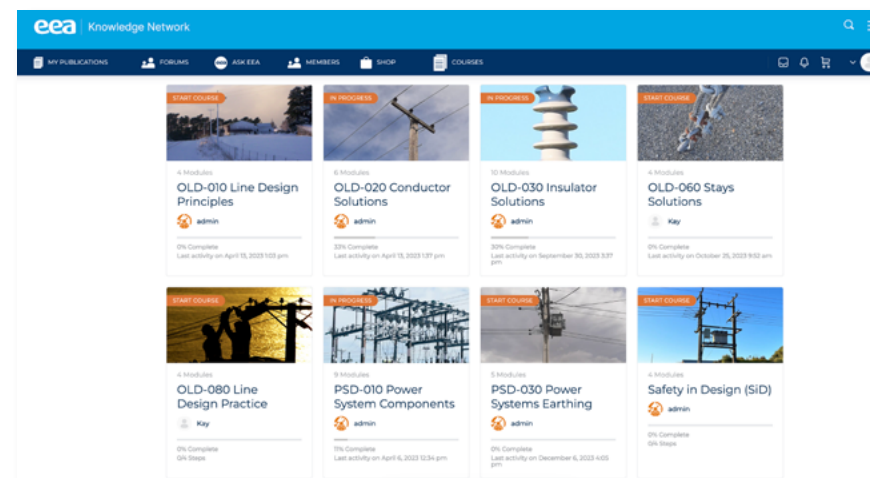
If you have any trouble registering, or any questions, please contact us on 04 473 8600 or email [admin@eea.co.nz](mailto:admin@eea.co.nz).

### Completing your course

Most EEA courses and modules are hosted on the EEA's Knowledge Network and after registration you'll get an email letting you know how to login to the system to begin your course. We'll let you know the next steps as you progress through your course work.

### Cancellation Policy

If you cancel at least 10 business days before the course commences, you will receive a full refund, minus a non-refundable \$100 administration fee. If you have not paid for your course, you will receive an invoice for the \$100 administration fee. If you cancel within 10 business days of the course starting date, you will be charged the full fee, even if you have not yet paid. A replacement attendee is an alternative option, but please let us know prior to the course start. Non-payment does not constitute a cancellation.



The Knowledge Network

## Contact details

Electricity Engineers' Association

Level 6, 138 The Terrace, Wellington 6011

PO Box 5324, Wellington 6145

New Zealand

Phone +64 4 473 8600

Email [admin@eea.co.nz](mailto:admin@eea.co.nz)

[www.eea.co.nz](http://www.eea.co.nz)